

Guns & Missiles Symposium

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40mm CTAS “Medium calibre goes in a new direction”

David Leslie, Chairman CTA-International



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CTA-International

- CTA International (CTAI) - private joint venture (JV) company 50/50 BAE Systems and Nexter Systems
- Dedicated Anglo-French team, focused on 40mm Cased Telescoped Armament System (CTAS)
- All UK and French staff are based in Bourges, France



Key Points:

The 40mm Cased Telescoped Armament System:

- **Demonstrated “Game changing” benefits at a system level**
- **Mandated by the UK MoD and preferred by the French DGA**
- **Development of the system is complete**
- **Qualification and Industrialisation has started**
- **Seeking global partners**

CT Technology background (Ammunition)

Unlike conventional rounds, the projectile is *'telescoped'* within the cartridge case and surrounded by propellant;

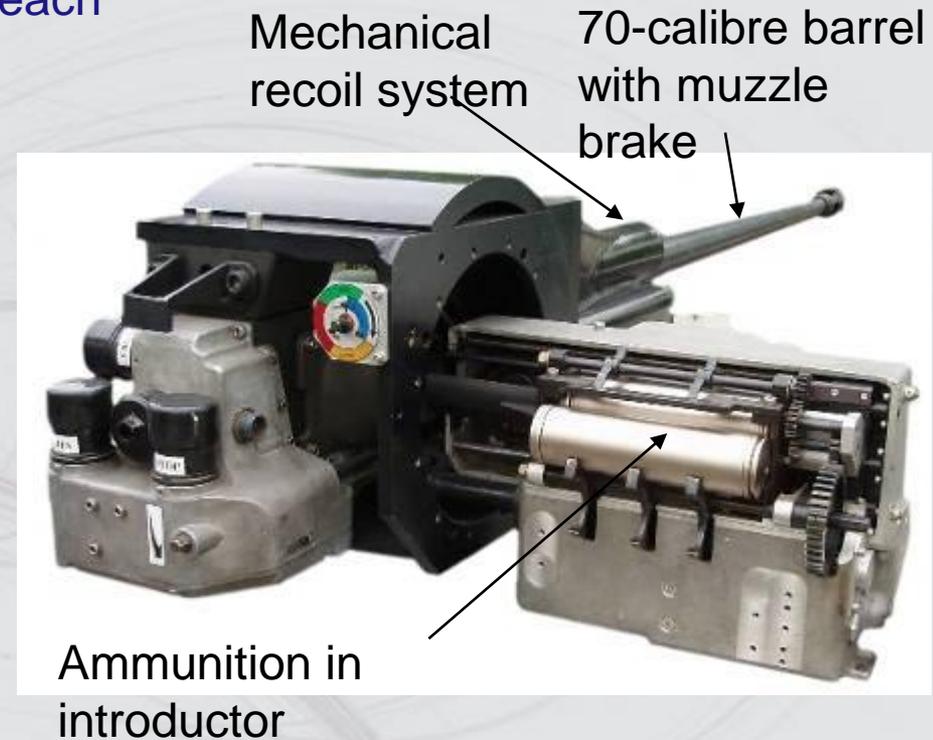
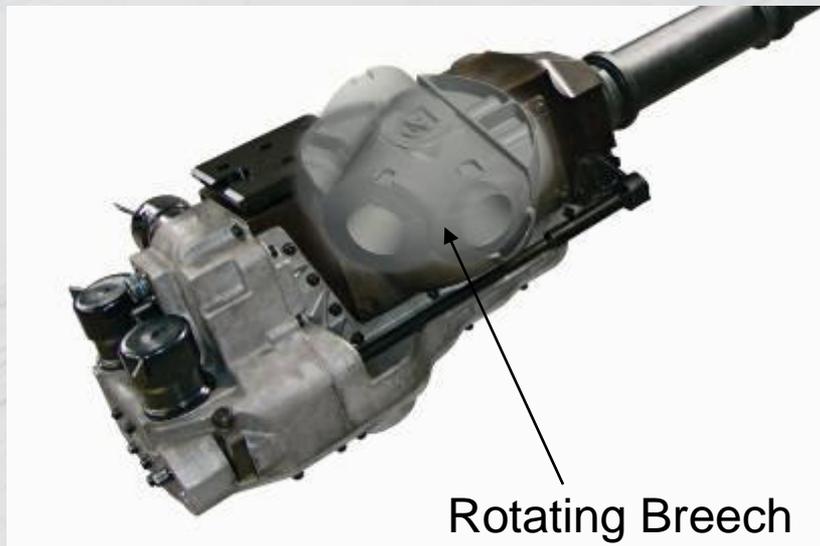
The cartridge case diameter is increased to provide efficient internal volume;

CT Ammunition is volumetrically 30% more efficient than conventional ammunition;



CT Technology background (Cannon)

Rounds introduced through rotating breech

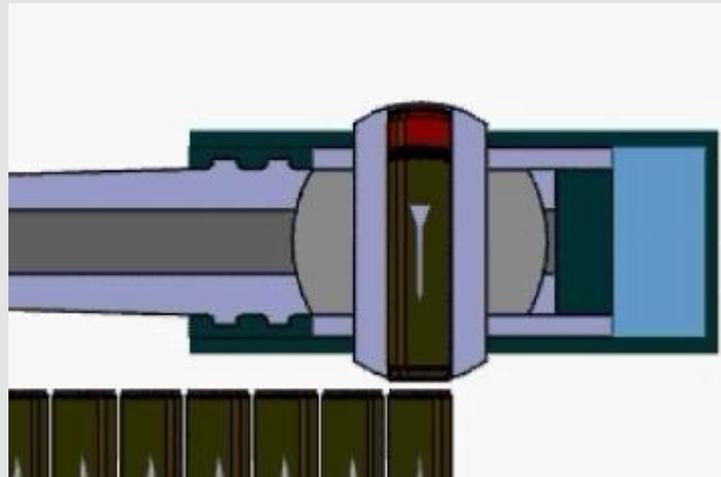
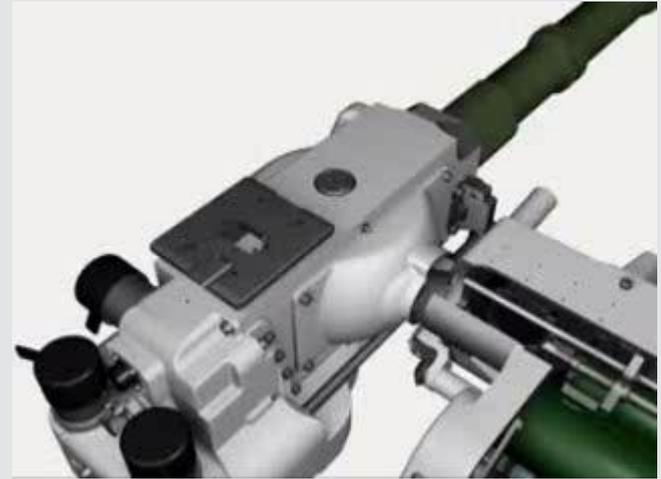


- 'Push-through' concept
- Commercial 'Gear box' technology
- High reliability

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CT Technology background (System)

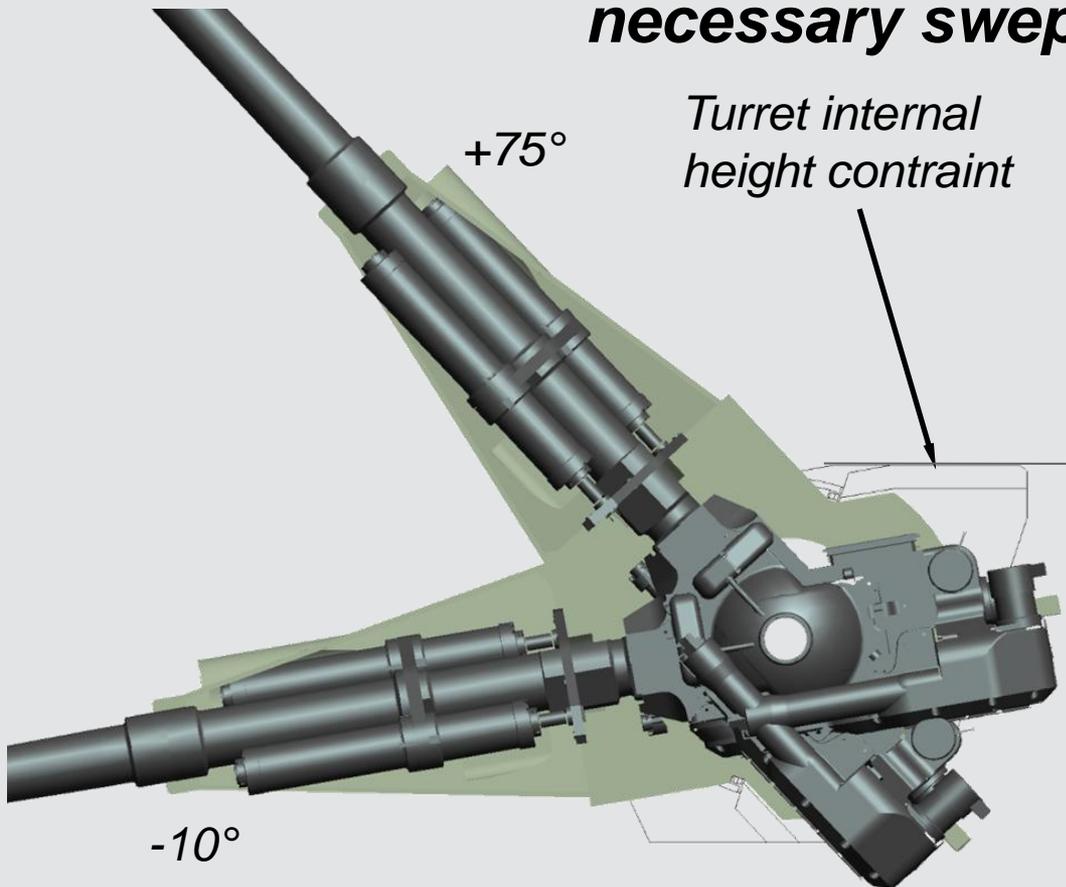
1. Ammunition enters the rotating breech
2. Breech revolves thru 90° to align with barrel
3. Round is fired, the breech recoils, the projectile leaves the barrel
4. breech revolves another 90°
5. Empty case is pushed out by the next round



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CT Technology background (System)

The ease of integration into a turret is defined by the necessary swept volume



- * Limits of elevation set by turret roof and floor plate
- * Free space created behind breech
- * Managed out-of-balance
- * Fixed trunnion location

CT Technology background (ammunition)

UK MoD Operational Analysis of 40mm CT (Unclassified quotes)

“...clear advantage in urban Operations, increases platform survivability...”



Defeat of RHA and add-on special armours



Point Detonating defeat of structures with behind-structure effect



Airburst suppression, both 'line of sight' & 'non line of sight' land and air targets



Defeat of soft skin targets

'APFSDS' ammunition

'GPR' ammunition
 i.e. Point Detonating + Air Burst fused HE ammunition combined in one general purpose round (GPR)

CT Technology system level impact

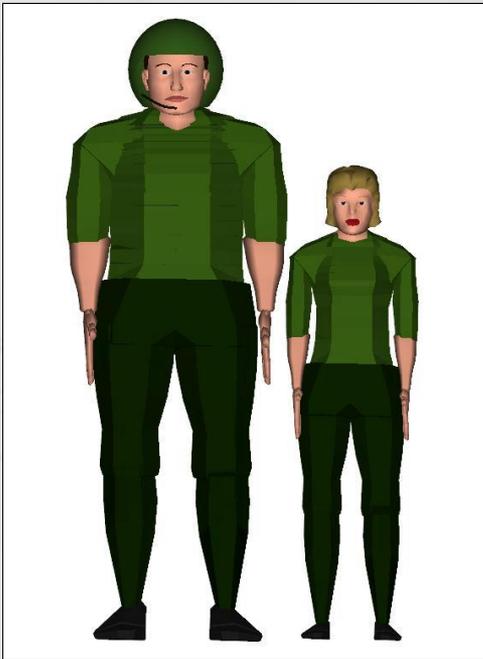
Minimal intrusion to the crew compartment compared to conventional weapon systems



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CT Technology system level impact

Future User needs:



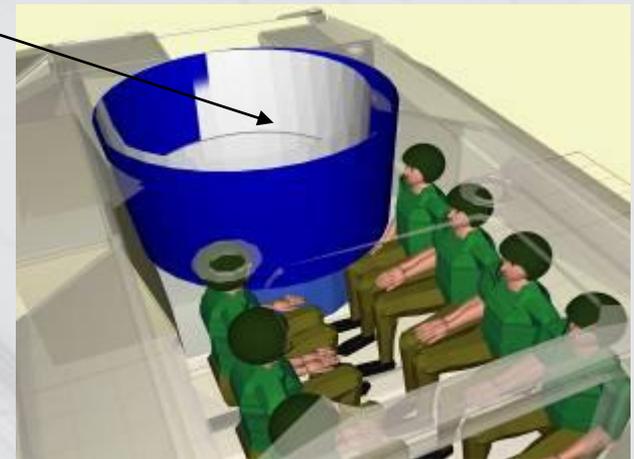
illustrative

“...higher firepower...”

...and need to maximise use of limited turret basket volume, small turret ring diameters and increases in crew carried kit...

...and need to accommodate

- 2x 95th percentile men***
- or 2x 5th percentile women***
- in full body armour and helmet...***

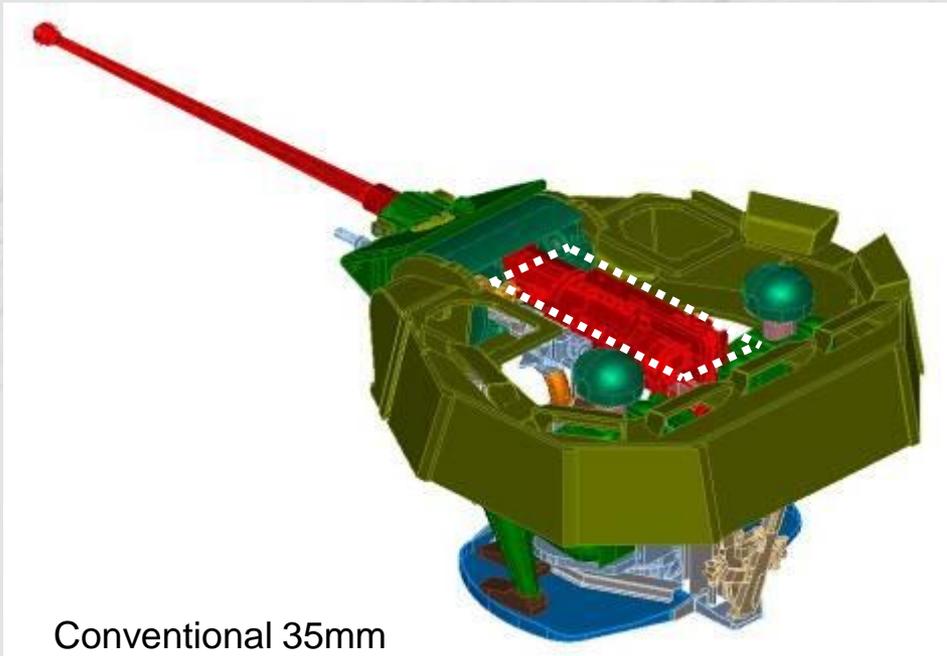


“...and increase crew survivability...”

CT Technology system level impact

Conventional gun and ammunition systems:

- over 200 litres of swept volume
- limited gun elevation/depression
- limitations on crew evacuation/survivability
- crew tasks compromised



Conventional 35mm



Conventional 30mm

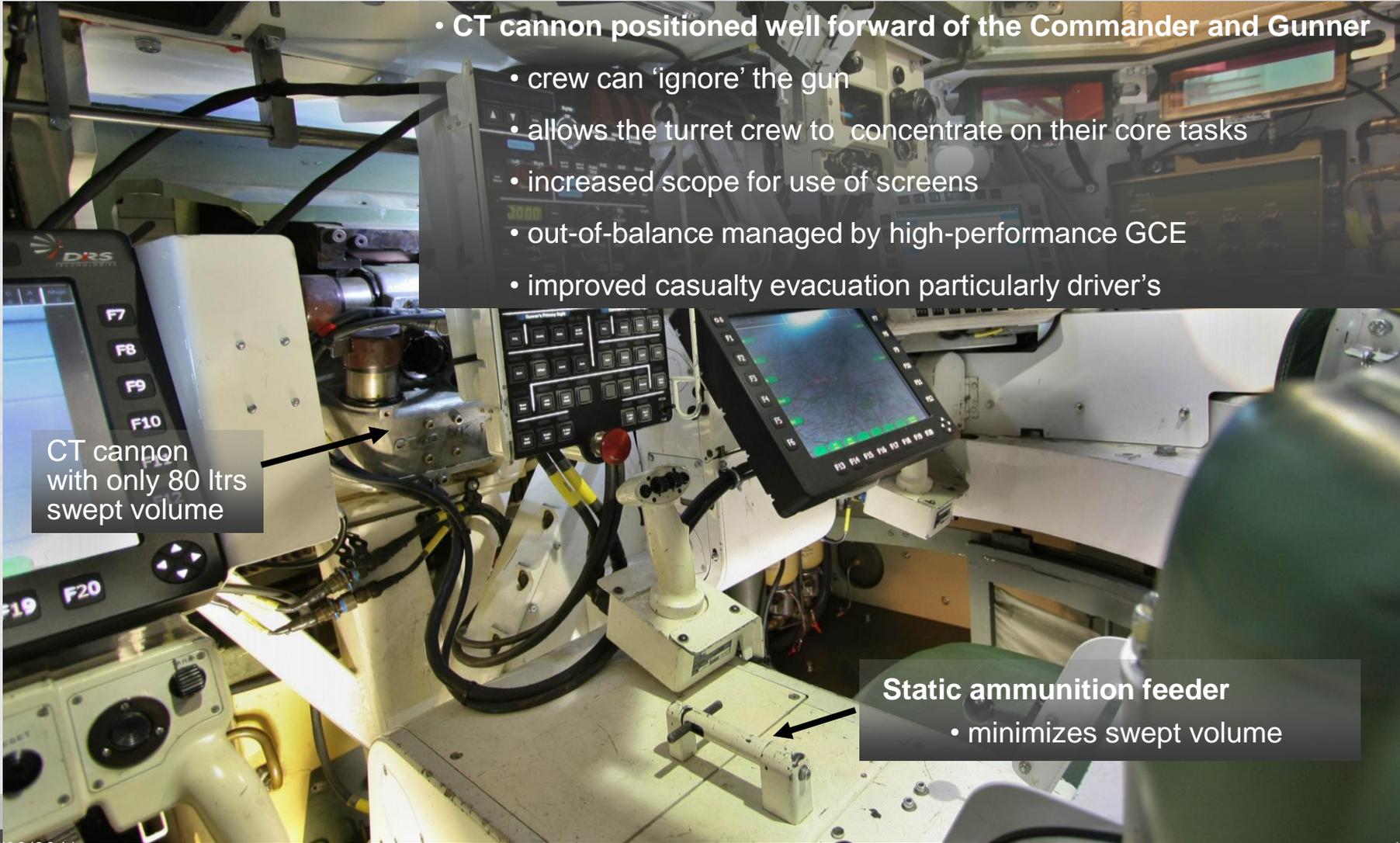
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CT Technology system level impact



CT Technology system level impact

- CT cannon positioned well forward of the Commander and Gunner
 - crew can 'ignore' the gun
 - allows the turret crew to concentrate on their core tasks
 - increased scope for use of screens
 - out-of-balance managed by high-performance GCE
 - improved casualty evacuation particularly driver's



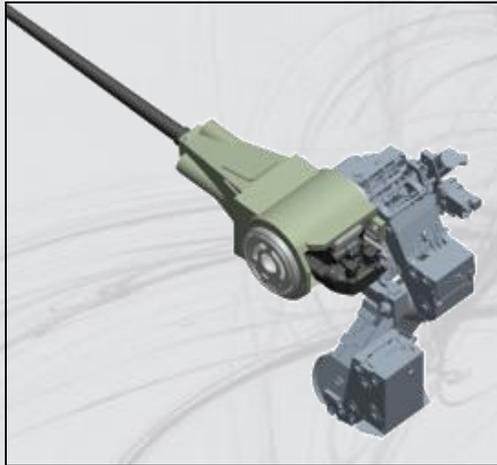
CT cannon
with only 80 ltrs
swept volume

Static ammunition feeder

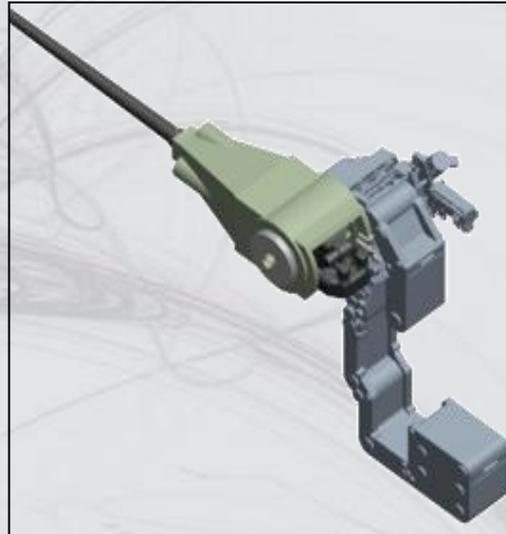
- minimizes swept volume

Turret Integration scope

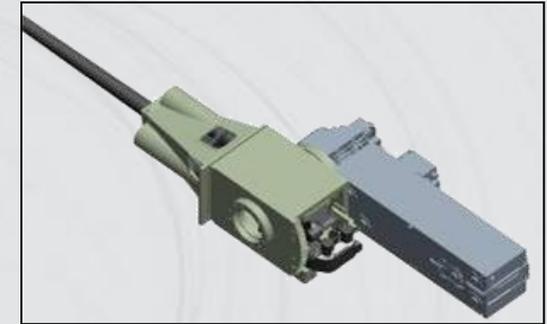
- Ammunition Handling systems adaptable to user requirements and turret design
- Sustainable reloading
- High/low turret elevations and depression angles possible



Tracked vehicle:
narrow turret ring,
shallow basket.



Wheeled vehicle:
narrow turret ring,
deep basket.



Tracked or wheeled
vehicle: remotely
operated turret.

Vehicle integration examples (2001-2011)



MTIP (CTAI)



Bradley (United Defence)



MTIP2 (BAE Systems)



VBCI (Nexter)



FSCS (Sika)



FRES SV (General Dynamics)



Toutatis (CTAI)



FSCS (Lancer)



WCSP (Lockheed Martin)

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Demonstrated Performance

FIRING ON THE MOVE ON MOVING TARGETS

- ✦ Full stabilization
- ✦ Coincidence firing mode
- ✦ High accuracy whilst in moving/moving scenario



UK MoD and French DGA Cooperation

“The MoD has down selected ... the cannon developed by CTAi....for both Warrior and FRES Scout programmes, as it meets the lethality requirements of both systems, and a single common solution is more efficient and effective.” Minister UK MoD, 2008

* UK MoD / French DGA Joint qualification of:

- * CT40 Weapon System (Mandated Items)
 - * Armour Piercing Fin Stabilised Discarding Sabot - Tracer (APFSDS-T)
 - * General Purpose Point Detonating - Tracer (GPR-PD-T)
 - * Target Practice - Tracer (TP-T)
 - * General Purpose Air Burst – Tracer (GPR-AB-T)
-
- * Over 70 trials & 100 Evaluations over 2 years (>12000 rounds of ammunition and >22000 weapon cycles)
 - * Ammunition Sequential Trials Programme
 - * Ammunition Non Sequential Trials
 - * Cannon Trials



Industrialisation

Use of existing Ammunition Manufacturing Facilities within the shareholder companies operating under licensed production

CTA INTERNATIONAL

BAE SYSTEMS

Glascoed, Wales



Bourges, France



nexter
MUNITIONS

La Chapelle, France



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Seeking global partners



Licence available for the complete system

Summary

- 40CT is moving from 'development' to 'industrialisation'
- 40CT offers an innovative approach to high lethality and lower integration burden
- Its introduction will radically change the medium calibre choices to potential global customers
- It is a rare business opportunity for new partners



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Questions?

